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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,655	06/27/2003	Christopher L. Coleman	10030279-1	2630
7590	07/23/2004		EXAMINER	
			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER
			2872	
DATE MAILED: 07/23/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

JL

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/607,655	COLEMAN, CHRISTOPHER L.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Audrey Y. Chang	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/27/2003.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. **Claims 1-4, 7-8, 16-18 and 20 rejected under 35 U.S.C. 102(e) as being anticipated by the patent issued to Unno et al (PN. 6,641,985).**

Unno et al teaches a *diffractive optical element* and a *method for making it*, wherein the diffractive optical element, (please see Figures 3 and 4), comprises a *quartz substrate*, (21) having *surface relief pattern* formed on a first side of the substrate, and an *anti-reflection coating* (layer 22, in Figure 3 or multilayer 23-24 in Figure 4), formed on the surface relief pattern wherein the anti-reflective coating has substantially the *same dimension* or *width dimension* as the surface relief pattern, (please see column 5, lines 20-55).

With regard to claims 2 and 17, the quartz substrate ( $\text{SiO}_2$ ) is a semiconductor substrate.

With regard to claim 3, the diffractive optical element forms a transmission grating.

With regard to claims 4 and 18, Unno et al teaches that the anti-reflective coating comprises *dielectric* layer materials such as metal oxide, (please see column 5 and line 43).

With regard to claims 7-8 and 20, Unno et al teaches that the surface relief pattern comprises a *first set of surfaces* that are *parallel* to the longitudinal surface of the substrate and are coated with the anti-reflective coating and comprises a *second set of surfaces* that are *perpendicular* to the longitudinal surface of the substrate that are not coated with or *free from* the anti-reflective coating, (please see Figures 3 and 4).

This reference has therefore anticipated the claims.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Unno et al and in view of the patent issued to Tran et al (PN. 5,853,960).**

The diffractive optical element taught by Unno et al as described for claim 1 above has met all the limitations of the claims. Unno et al teaches that the anti-reflective coating may be formed by dielectric layer material such as metal oxides, however it does not teach explicitly that it also includes the materials claimed, (i.e. silicon dioxide and silicon nitride etc.). But these materials are extremely well known dielectric materials for making anti-reflective coating, as demonstrated by the teachings of Tran et al, (please see column 9, lines 7-19). It would then have been obvious to one skilled in the art to apply the teachings of Tran et al to modify the anti-reflective coating of Unno et al to utilize dielectric materials such as silicon dioxide or silicon nitride for the benefit of making the anti-reflective coating

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with desired optical characteristics. It further has been held that it is within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended used as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

**5. Claims 6, 9-11, 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Unno et al.**

Unno et al teaches a *diffractive optical element* and a *method* for making it, wherein the diffractive optical element, (please see Figures 3 and 4), comprises a *quartz substrate*, (21) having *surface relief pattern* formed on a first side of the substrate, and *an anti-reflection coating* (layer 22, in Figure 3 or multilayer 23-24 in Figure 4), formed on the surface relief pattern wherein the anti-reflective coating has substantially the *same dimension* as the surface relief pattern, (please see column 5, lines 20-55).

This reference has met all the limitations of the claims. Unno et al teaches that the anti-reflective coating may be **deposited** directly on the substrate or **deposited** on the underlying film (12). However Unno et al does not teach explicitly that the anti-reflective coating is *deposited directionally* via the deposition process such as sputtering. Unno et al *does teach* explicitly that the underlying layer film (12) that is dielectric in nature can be deposited on the substrate using *directionally selective deposition* process via *sputtering* system, (please see Figure 2 and column 4, lines 27-37, and 55-64). It would then have been obvious to one skilled in the art to apply the explicitly teachings of deposition process and system disclosed by Unno et al to also carry out the deposition of the antireflective coating for the benefit of using the same and conventional arrangement to form the coating to save the manufacturing cost.

With regard to claim 10, the quartz substrate ( $\text{SiO}_2$ ) is a semiconductor substrate.

With regard to claim 11, Unno et al teaches that the anti-reflective coating comprises dielectric layer materials such as metal oxide, (please see column 5 and line 43).

With regard to claim 15, the sputtering system is disclosed in Figure 2.

6. **Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Unno et al as applied to claim 9 above, and further in view of the patent issued to Tran et al.**

The *diffractive optical element* taught by Unno et al as described for claim 9 above has met all the limitations of the claims. Unno et al teaches that the anti-reflective coating may be formed by dielectric layer material such as metal oxides, however it does not teach explicitly that it includes the materials claimed, (i.e. silicon dioxide and silicon nitride etc. in claim 12). But these materials are extremely well known dielectric materials for making anti-reflective coating, as demonstrated by the teachings of Tran et al, (please see column 9, lines 7-19). It would then have been obvious to one skilled in the art to apply the teachings of Tran et al to modify the anti-reflective coating of Unno et al to utilize dielectric materials such as silicon dioxide or silicon nitride for the benefit of making the anti-reflective coating with desired optical characteristics. It further has been held that it is within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended used as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

With regard to claims 13-14, Unno et al teaches conventional film deposition systems, such sputtering system and vacuum deposition system can be used to deposit the film, (please see column 4, lines 27-32). However it does not teach explicitly that the anti-reflective coating may also be deposited by *electron beam evaporation process*. But electron beam evaporation process is an *equally well known* coating process for making anti-reflective coating as taught by Tran et al (please see column 9, lines 7-19). It would then have been obvious to one skilled in the art to apply the teachings of Tran et al to use the electron beam evaporation process as an alternative method for forming the anti-reflective coating for the benefit of using alternative yet well-known process to form the coating.

*Contact Information*

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A. Chang, Ph.D.

*Audrey Y. Chang  
Primary Examiner  
Art Unit 2872*